

SPEECH BY DR. JAMES C. FLETCHER

PREPARED FOR DELIVERY

AT THE

LOS ANGELES AREA CHAMBER OF COMMERCE

14TH ANNUAL AEROSPACE LUNCHEON

BEVERLY HILTON HOTEL

LOS ANGELES, CALIFORNIA

NOON, OCTOBER 1, 1971

SINCE BECOMING ADMINISTRATOR OF NASA LAST MAY, I HAVE FOUND PUBLIC OFFICE TO BE SOMETHING OF A MIXED BLESSING. ON THE ONE HAND I AM AFFORDED THE OPPORTUNITY OF PARTICIPATING IN A VERY EXCITING PROGRAM AND OF MEETING WITH A GREAT MANY INTERESTING AND DISTINGUISHED PEOPLE SUCH AS YOURSELVES. ON THE OTHER, I AM THE UNSOLICITING RECIPIENT OF MUCH WELL INTENDED COUNSEL.

I HAVE BEEN TOLD IN RECENT WEEKS, FOR EXAMPLE, THAT THE EXPLORATION OF SPACE IS NO LONGER IN VOGUE ... THAT THE FUTURE DEVELOPMENT OF SPACE TECHNOLOGY MUST TAKE A BACK SEAT TO MORE IMPORTANT THINGS.

THE FIRST QUESTION ASKED ME BY THE PRESS AFTER ASSUMING OFFICE WAS DID I NOT FEEL "... SOMETHING LIKE THE CAPTAIN OF THE TITANIC?"

TO SUCH PEOPLE I OWE A GREAT DEBT. I AM INDEBTED NOT BECAUSE OF THEIR LACK OF CONFIDENCE IN THE CONTINUED ADVANCEMENT OF THE GREATEST TECHNOLOGICAL EVOLUTION IN THE HISTORY OF MANKIND ... BUT, INDEBTED FOR REMINDING US THAT THE CHALLENGE WE FACE IS EDUCATIONAL AS WELL AS TECHNOLOGICAL -- THAT WE MUST DO A BETTER JOB OF CONVINCING THE MAN-ON-THE-STREET OF THE PROGRAM'S MERITS, IF WE ARE TO GET THE PUBLIC SUPPORT WE NEED.

WHAT WE MUST DO IS TO GIVE THE PUBLIC THE INFORMATION IT NEEDS TO PUT ITS PRIORITIES IN PROPER PERSPECTIVE.

WE HEAR A LOT THESE DAYS ABOUT WHAT'S WRONG WITH AMERICA AND ABOUT THE NEED TO REORDER OUR PRIORITIES.

WELL, I'M HERE TO TELL YOU THAT THERE IS SOMETHING SERIOUSLY WRONG, THAT OUR PRIORITIES ARE OUT OF WHACK WHEN AS A NATION WE PAY PEOPLE MORE NOT TO WORK AND MORE IN FARM SUBSIDIES THAN WE DO ON SPACE RESEARCH, A PROGRAM WHICH IMPACTS OUR NATIONAL ECONOMY AND VITALLY AFFECTS OUR NATIONAL SECURITY.

I SAY THERE IS INDEED SOMETHING WRONG WITH OUR SENSE OF PRIORITIES WHEN SCIENTISTS HAVE TO DEFEND WITH ALMOST EVERY BREATH THE \$3.3 BILLION BEING SPENT ON SPACE RESEARCH IN A NATION THAT SPENDS \$17 BILLION -- FIVE TIMES AS MUCH -- FOR TOBACCO PRODUCTS AND COSMETICS.

I DON'T NEED TO BE TOLD THAT OUR SENSE OF PRIORITIES IS DANGEROUSLY LOPSIDED WHEN HERE IN LOS ANGELES SOME OF THE MOST TALENTED MEMBERS OF OUR TECHNOLOGICAL TEAM ARE DRIVING TAXIS FOR A LIVING WHILE WE ARE SLIPPING BEHIND EUROPE IN AERONAUTICAL ENGINEERING AND THE SOVIET UNION IS PULLING AHEAD OF US IN MANY AREAS OF SPACE EXPLORATION.

IS A FORMER UNIVERSITY PRESIDENT. I AM PROBABLY MORE AWARE OF THE SENTIMENTS OF THE YOUNGER GENERATION AND THE NATIONAL PRESSURES BUILDING FOR RE-EXAMINING OUR PRIORITIES AND FOR REDRESSING INJUSTICES. AS AN INDIVIDUAL I AGREE WITH MANY OF THESE OBJECTIVES. WHERE I PART COMPANY IS ON THE WAY TO BEST ACHIEVE THESE GOALS.

AS A SCIENTIST, I KNOW THAT THE ANSWER TO MANY OF OUR SOCIAL PROBLEMS -- WORLDWIDE AS WELL AS DOMESTIC -- IS TO BE FOUND THROUGH TECHNOLOGY. IN A MATURE ECONOMIC SOCIETY SUCH AS OURS, A STRONG TECHNOLOGICAL BASE IS A PREREQUISITE FOR ECONOMIC PROGRESS, WHICH IN TURN MAKES POSSIBLE SOCIAL PROGRESS.

THIS IS WHY I AM SO CONCERNED ABOUT MAINTAINING OUR TECHNOLOGICAL CAPABILITY AND A HEALTHY AEROSPACE INDUSTRY. THIS IS NOT SIMPLY A LOS ANGELES PROBLEM OR A SOUTHERN CALIFORNIA PROBLEM. IT IS NOT LOCAL OR REGIONAL IN NATURE. IT IS A NATIONAL PROBLEM OF THE GREATEST IMPORTANCE.

TECHNOLOGY IS THIS NATION'S GREATEST NATURAL RESOURCE. IT IS THE FUEL THAT HAS PROVIDED THE THRUST FOR AMERICA'S MIRACULOUS ECONOMIC GROWTH. JUST A QUICK GLANCE AT THE FORTUNE 500 LIST SHOWS THAT MOST OF OUR GREATEST CORPORATIONS WERE BORN OUT OF THE DEVELOPMENT OF NEW TECHNOLOGY. CERTAINLY IT'S ALSO TRUE THAT OUR FASTEST GROWING CORPORATIONS ARE HIGH TECHNOLOGY COMPANIES, WHOSE GROWTH DEPENDS ON THE CONTINUING DEVELOPMENT OF NEW TECHNOLOGY.

A STRONG TECHNOLOGY BASE IS ABSOLUTELY VITAL TO THE UNITED STATES IN TERMS OF ITS CONTRIBUTIONS TO INTERNATIONAL PRESTIGE, NATIONAL SECURITY, AND DOMESTIC PEACE OF MIND.

I INTEND TO SPEAK UP IN THE COUNCILS OF GOVERNMENT AT EVERY OPPORTUNITY TO PRESS THE CASE FOR TECHNOLOGY. I INTEND TO SAY MY PIECE AND SAY IT LOUDLY AND CLEARLY FOR ALL TO HEAR, BECAUSE I AM CONVINCED THAT FURTHER EROSION OF OUR TECHNOLOGICAL LEADERSHIP WILL START US ON A DOWNHILL COURSE FROM WHICH IT WILL BE DIFFICULT TO RECOVER.

THERE ALWAYS HAVE AND ALWAYS WILL BE DOUBTING THOMASES -- MANY OF THEM PROMINENT AND WELL-INTENTIONED.

IN 1844, FOR EXAMPLE, DANIEL WEBSTER SPOKE IN OPPOSITION TO AN APPROPRIATION OF \$30,000 TO ESTABLISH A MAIL SERVICE TO THE PACIFIC COAST. HIS WORDS ON THE FLOOR OF THE UNITED STATES SENATE WERE: "WHAT DO WE WANT OF THE VAST WORTHLESS AREA? WHAT USE CAN WE HAVE FOR SUCH A COUNTRY?"

DOES THAT SOUND FAMILIAR? IT SHOULD. FOR, THERE ARE THOSE TODAY WHO WOULD SEVERELY LIMIT THE ECONOMIC AND CULTURAL DEVELOPMENT OF OUR COUNTRY AND REDUCE THE GREAT NATION OF WHICH WE ARE PART TO A SECOND CLASS STATUS.

BUT, WE SHOULD NOT BE TOO HARSH WITH CRITICS, FOR THEY DO RENDER AN IMPORTANT SERVICE BY REMINDING US REPEATEDLY OF THE NEED TO GAIN PUBLIC UNDERSTANDING AND SUPPORT FOR THE SPACE PROGRAM. FOR IN OUR ZEAL TO FORGE AHEAD IN TECHNICAL AND SCIENTIFIC FIELDS, IT IS POSSIBLE TO LOSE SIGHT OF THE DEBT WE OWE TO THE GREAT AMERICAN PUBLIC THAT SO STEADFASTLY SUSTAINED US DURING THE EARLY YEARS.

WE SHOULD NOT -- WE CANNOT -- BLAME THE PUBLIC FOR BEING MORE INTERESTED IN TAXATION, SOCIAL SECURITY BENEFITS AND FARM SUBSIDIES. THESE FINANCIAL OUTLAYS AFFECT HIM DIRECTLY AND ALMOST DAILY. THE AVERAGE AMERICAN -- LIKE YOU AND ME -- HAS HIS PRIORITIES TOO. BUT HE NEEDS TO BE INFORMED IF HE IS TO ARRIVE AT AN INTELLIGENT DECISION ABOUT HOW TO RANK HIS PRIORITIES.

THE BURDEN OF EXPLAINING -- AND EVEN CONVINCING -- THE PUBLIC OF THE NECESSITY FOR CONTINUING A WELL-BALANCED SPACE PROGRAM FOR THE 1970'S AND BEYOND LIES WITH THOSE OF US SO DIRECTLY INVOLVED. IN THIS EFFORT WE SHOULD BE COMFORTED BY THE KNOWLEDGE THAT, DESPITE THE DISSENTERS OF YESTERDAY -- AND THERE HAVE BEEN MANY -- THE CHARACTER AND FINAL JUDGMENT OF AMERICANS IS CLEARLY RECORDED IN THE PROGRESSIVE AND PIONEERING HISTORY OF THIS COUNTRY.

PRESIDENT NIXON, IN HIS ACKNOWLEDGED PERSONAL COMMITMENT TO ADVANCING THE EXPLORATION OF SPACE, HAS, I THINK, REFLECTED THE SENTIMENTS OF THE VAST MAJORITY OF THE AMERICAN PUBLIC AND THEIR ELECTED REPRESENTATIVES.

BEFORE A JOINT SESSION OF THE CONGRESS ON SEPTEMBER 3, HE AGAIN PAID TRIBUTE TO THE KEY ROLE OF TECHNOLOGY IN THE NATION'S PAST ACHIEVEMENTS. HE ALSO EMPHASIZED THE ROLE OF TECHNOLOGY IN THE FUTURE, AS HE SPOKE OF THE NEED FOR "NEW PROGRAMS TO ENSURE THAT AMERICA'S ENORMOUS WEALTH OF SCIENTIFIC AND TECHNOLOGICAL TALENT IS USED TO ITS FULLEST IN THE PRODUCTION FOR PEACE."

NO ONE CAN BETTER UNDERSTAND AND APPRECIATE THE PRESIDENT'S MESSAGE THAN THOSE OF YOU HERE TODAY. CALIFORNIA HAS LONG BEEN RECOGNIZED AS ONE OF THE GREAT TECHNOLOGY CENTERS OF THE WORLD. YOUR GREAT AEROSPACE INDUSTRY, ALONE, HAS DEMONSTRATED OUTSTANDING LEADERSHIP.

WE PAINFULLY RECALL HOW AMERICA ENTERED THE AGE OF SPACE FAR BEHIND THE SOVIET UNION. IT TOOK A SPUTNIK TO LITERALLY SCARE US INTO ACTION. BUT AMERICA'S COMPETENT INDUSTRIAL AND TECHNOLOGICAL INSTITUTIONS RESPONDED. WITHIN A RELATIVELY SHORT PERIOD OF TIME WE ESTABLISHED DECISIVE PRE-EMINENCE IN SPACE. AMERICA, IN THE EYES OF THE WORLD, WAS THE UNCHALLENGED LEADER IN TECHNOLOGY.

BUT SOMETHING HAS HAPPENED ALONG THE WAY. AS SOME PHILOSOPHER HAS SAID, "THE FUTURE ISN'T WHAT IT USED TO BE."

THE SPACE PROGRAM, WITH ITS BROAD ENGINEERING AND SCIENTIFIC GOALS, IS BEING SERIOUSLY CHALLENGED NOT BY THE TIRED VOICES AND REDUNDANT PENS OF A FEW CRITICS ... BUT, BY OUR OWN APPARENT INABILITY TO TRANSLATE THE BROAD DIVERSE BENEFITS OF SPACE INTO TERMS THAT ARE MEANINGFUL TO THE PUBLIC AT LARGE. AS SCIENTISTS WE RECOGNIZE THE CONTRIBUTIONS OF ADVANCED TECHNOLOGY, BUT POSSIBLY BECAUSE WE ARE PERSONALLY SO DEEPLY INVOLVED, WE OFTEN FIND IT DIFFICULT TO UNDERSTAND WHY EVERYONE DOESN'T SEE THE VALUE AS CLEARLY AS WE DO. WE NEED TO BRIDGE THE INFORMATION GAP AND EXPLAIN TO THE LARGEST POSSIBLE AUDIENCE WHY SPACE IS SO VITAL TO THE FUTURE WELL-BEING OF ALL MANKIND. TO SUCCEED WE NEED TO REDOUBLE OUR EFFORTS, STARTING NOW.

LET US, THEN, FIND THE FORUMS TO EXPLAIN THAT THE EXPLORATION AND HARNESSING OF SPACE IS NOT A FOURTH OF JULY FIREWORK DISPLAY THAT CAN BE SET UP, LIGHTED FOR ENTERTAINMENT AND PUT AWAY UNTIL THE NEXT YEAR; IT IS A NATIONAL ASSET, THE ENGINE THAT GENERATES THE TECHNOLOGY NEEDED TO KEEP AMERICA COMPETITIVE ECONOMICALLY AND SECURE MILITARILY.

OVER THE YEARS, WE HAVE SEEN WESTERN EUROPE AND JAPAN MOVE WITH INCREASING ASSURANCE INTO FIELDS OF HIGH TECHNOLOGY WHERE WE WERE ONCE ACKNOWLEDGED LEADERS.

AMERICANS INVENTED THE TRANSISTOR, BUT WE DO NOT LEAD IN SOLID-STATE ELECTRONICS TODAY.

AMERICANS INVENTED THE COMPUTER AND ADVANCED ITS CAPABILITIES -- ESPECIALLY THROUGH THE SPACE PROGRAM -- BY ORDERS OF MAGNITUDE. TODAY, THE MARKET FOR SMALLER COMPUTERS (NOW IN DEMAND) IS MEETING EVER-STRONGER COMPETITION FROM ABROAD.

IN AREAS SUCH AS TEXTILE MANUFACTURE, IRON AND STEEL, SHIPBUILDING AND MANY OTHERS, THE UNITED STATES LAGS TO THE POINT THAT WE ARE NO LONGER REALLY IN THE RACE.

THE MOST OMINOUS LAG OF ALL, HOWEVER, IS IN THE DEVELOPMENT OF NEW TECHNOLOGY FOR MILITARY AND CIVIL AVIATION. IF WE ARE LOSING OUR EDGE IN THAT FIELD, WHERE WE HAVE HELD THE LEADERSHIP FOR SO LONG, ONE THING IS CLEAR: WE ARE NOT LOSING BECAUSE THE EUROPEANS OR THE SOVIETS OR ANYONE ELSE HAVE SUPERIOR ABILITY. SAD TO SAY IT IS NOT A MATTER OF DEFEAT -- BUT OF DEFAULT.

IF THIS TREND CONTINUES, I WOULD PREDICT WITH SOME CERTAINTY THAT SOMEDAY, AT SOME TIME, THE UNITED STATES WILL BE FORCED -- WHETHER BY PEACEFUL, ECONOMIC COMPETITION OR BY THREAT TO OUR NATIONAL SECURITY -- TO REGROUP OUR SPACE INDUSTRY TEAM AND OUTPACE ANOTHER "SPUTNIK." IN THE LONG RUN, THIS WILL BE FAR MORE COSTLY TO THE TAXPAYER THAN THE PRICE OF A CONTINUING WELL-BALANCED SPACE PROGRAM.

THE SPACE PROGRAM, AS YOU ARE SO WELL AWARE IN SOUTHERN CALIFORNIA, HAS BEGUN LOSING ITS TALENTED CADRE OF TRAINED ENGINEERS, SCIENTISTS, AND ADMINISTRATORS. HOW, THEN, CAN YOU PLAY "CATCH-UP" FOOTBALL WITHOUT A FULL TEAM? I CAN TELL YOU, NOT VERY WELL.

WE STAND TO BE REMINDED OCCASIONALLY THAT ONCE ENGLAND WAS THE QUEEN OF THE SEAS. WHEN THAT POWER DIMINISHED, HER GREAT EMPIRE CRUMBLED AND SHE LOST HER PROMINENT PLACE IN WORLD AFFAIRS.

THE CORNERSTONE OF AMERICA'S MIGHT IS ITS TECHNOLOGY. THE IMPLICATIONS ARE SELF-EVIDENT.

TODAY, AFTER SOME 13 SUCCESSFUL YEARS OF AMERICA'S SPACE PROGRAM, THE AVERAGE U. S. CITIZEN HAS QUIETLY ACCEPTED SPACE EXPLORATION AS JUST ONE MORE FACT OF LIFE.

JUST AS HE NOW TAKES FOR GRANTED OTHER FORMER WONDERS SUCH AS THE TELEPHONE, THE MOTION PICTURE, AND THE AUTOMOBILE, HE DOES NOT CONSIDER SPACE EXPLORATION A NOVELTY ANYMORE. SPACE HAS NOW GAINED TOTAL ACCEPTANCE AS PART OF THE FABRIC OF EVERYDAY LIVING.

BUT WE MUST BE PREPARED TO JUSTIFY THE TAXES AMERICANS PAY TO SUPPORT THE SPACE PROGRAM. THE TAXPAYER HAS THE RIGHT TO KNOW -- AND WE HAVE AN OBLIGATION TO TELL HIM -- WHAT KIND OF A RETURN ON INVESTMENT HE IS GETTING FOR HIS MONEY. FORTUNATELY, WE HAVE A STRONG CASE. WE HAVE POSITIVE ANSWERS TO QUESTIONS LIKE "WHAT DO I GET FROM SPACE?" AND "WHAT IMPORTANCE DOES SPACE HAVE IN MY FUTURE?"

YOU HERE IN SOUTHERN CALIFORNIA ARE IN A PARTICULARLY GOOD POSITION TO TELL THAT STORY. YOU KNOW WHAT AEROSPACE MEANS TO THE ECONOMY, TO EDUCATION, AND TO TECHNOLOGICAL ADVANCEMENT.

ANOTHER QUESTION: HOW WILL THE SPACE PROGRAM HELP THE AVERAGE CITIZEN, NOW AND IN THE YEARS TO COME?

WE MIGHT START WITH SOME OF THE PRACTICAL APPLICATIONS ON NEAR-EARTH ORBITAL SPACECRAFT.

TAKE COMMUNICATIONS SATELLITES. THE AVERAGE CITIZEN PROBABLY SEES TRANSOCEANIC COLOR TELEVISION PROGRAMS ALMOST EVERY DAY. OF COURSE, THIS ALSO HAS ITS DRAWBACKS -- DAD NEWS HAS ALWAYS TRAVELED FAST, BUT NOW IT IS INSTANTANEOUS.

MY POINT IS THIS. WE NEED TO REMIND PEOPLE THAT THESE NEW COMMUNICATION MIRACLES COME STRAIGHT FROM SPACE RESEARCH, COURTESY OF NASA.

WE NEED TO TELL THEM ALSO ABOUT THE COMMUNICATIONS MIRACLES THEY DO NOT SEE -- ABOUT COMMERCIAL AND BUSINESS COMMUNICATIONS THAT ARE FASTER AND CHEAPER BY FAR THAN EVEN A FEW YEARS AGO. AND ABOUT NOW, LESS THAN TWO YEARS FROM NOW, NASA SATELLITE TECHNOLOGY, THRU THE MEDIUM OF EDUCATIONAL TV, WILL HELP EDUCATE PREVIOUSLY ILLITERATE NATIVES OF INDIA IN THE SMALLEST BACK-COUNTRY SETTLEMENTS. OUR EXPERIMENTAL ATS-F SATELLITE WILL BEAM EDUCATIONAL TV DIRECTLY TO LOW-COST RECEIVERS IN 5,000 VILLAGES. AND THAT'S JUST THE BEGINNING. WE CAN'T EVEN BEGIN TO ESTIMATE THE FUTURE POTENTIAL AND VALUE OF THIS PROJECT ALONE.

MAKE SURE THE BENEFITS ARE MADE CLEAR -- FOR THIS IS AN ENORMOUSLY EFFECTIVE WAY OF ATTACKING WORLDWIDE PROBLEMS INVOLVING IGNORANCE, HUNGER, AND DISEASE.

IN AN EVEN MORE DIRECT WAY, NASA'S EARTH RESOURCES TECHNOLOGY SATELLITE PROGRAM WILL ATTACK PROBLEMS OF MALNUTRITION AND HUNGER.

AGAIN THE STORY SHOULD BE FAMILIAR TO YOU. YOU MUST BE PREPARED TO SHARE YOUR KNOWLEDGE OF SATELLITES THAT CAN IDENTIFY CROPS, DETECT INSECT INFESTATIONS AND BLIGHT, MONITOR SOIL CONDITIONS, AND THUS ENABLE FARMERS TO RAISE BIGGER AND BETTER CROPS. YOU PROBABLY ALREADY KNOW THAT NASA IS MONITORING ON A DAILY BASIS THE SPREAD OF CORN BLIGHT (IN THIS COUNTRY, A DISEASE THAT, IF LEFT UNCHECKED, WOULD DESTROY A MAJOR PORTION OF THE MOST PRODUCING CAPABILITY OF OUR NATION.)

TELL OF HOW SATELLITES WILL BE ABLE TO TAKE READINGS ON OCEAN TEMPERATURES AND CURRENTS, MONITOR AREAS WHERE FISH ARE ABUNDANTLY LOCATED, MAKING AVAILABLE ONE OF THE MOST NUTRITIONAL AND LEAST EXPENSIVE SOURCES OF HIGH-GRADE PROTEIN TO FEED THE WORLD'S HUNGRY AND UNDER-NOURISHED.

OR, IF THE SUBJECT OF POLLUTION AND WORLD ECOLOGY ARISES, BE SURE TO MENTION THE POSSIBILITY OF A GLOBAL ENVIRONMENTAL MONITORING SYSTEM WHICH WATCHES OVER ALL PORTIONS OF THE THIN VENEER ON OUR PLANET'S SURFACE WHICH SUPPORTS LIFE -- THE BIOSPHERE. SATELLITES, TOGETHER WITH ASSOCIATED GROUND MONITORING EQUIPMENT FOR CALIBRATION, CAN DETECT MAJOR POLLUTERS AND HOW THEY IMPACT ON THEIR NEIGHBORS AND ON OTHERS THOUSANDS OF MILES AWAY. THEY CAN ALSO DETECT MINUTE CHANGES IN GLOBAL ENVIRONMENT -- CHANGES IN THE OZONE LAYER, THE CO₂ CONTENT AND OXYGEN CONTENT OF THE ATMOSPHERE -- TINY INCIDENTS WHICH ARE CAPABLE OF PRODUCING MAJOR CHANGES IN WORLD ECOLOGY. SIGNALS WHICH WARN NOT ONLY OF HEMISPHERE CONTAMINATION BUT WORLD-WIDE WEATHER CHANGES, EVEN THE POSSIBILITY OF A RETURN OF ANOTHER ICE AGE. THE MONITORING SYSTEM ALSO HAS THE POTENTIAL OF DETECTING NOT ONLY ILLEGAL POLLUTERS BUT ILLEGAL CROPS -- MARIJUANA, POPPIES, ETC. -- AS WELL, WITH A SYSTEM THAT TRANSCENDS NATIONAL BOUNDARIES.

TIME REALLY DOES NOT PERMIT GOING INTO DETAIL OVER THE MANY BENEFITS, DIRECT AND INDIRECT, OF SPACE EXPLORATION. WEATHER SATELLITES, NAVIGATION SATELLITES, GEODETIC SATELLITES, MEDICAL RESEARCH SPIN-OFFS, AND SO ON -- EACH OF THESE SUBJECTS IS WORTH ENTIRE SPEECHES RATHER THAN THIS KIND OF HASTY MENTION. MY POINT IS THAT WE HAVE A POSITIVE STORY TO TELL, AND WE SHOULD TELL IT IN A POSITIVE WAY.

BUT WE HAVE ANOTHER MESSAGE TO CONVEY.

FOR YEARS, PUBLIC INTEREST IN THE SPACE PROGRAM HAS CENTERED ON MAN IN SPACE ... THE MERCURY, GEMINI AND APOLLO MISSIONS. DURING THE SAME PERIOD OF THESE MOMENTOUS AND EVEN GRIPPING FLIGHTS, HOWEVER, EQUALLY SIGNIFICANT SCIENTIFIC, METEOROLOGICAL, COMMUNICATION AND OTHER SUCCESSFUL UNMANNED PROJECTS WERE BEING CARRIED OUT WITH FAR LESS PUBLIC EXPOSURE.

WE MUST, THEREFORE, STRESS AND BETTER EXPLAIN TO THE MAN-IN-THE-STREET THE IMPORTANCE OF THESE PROGRAMS. THESE ARE EXCITING ADVENTURES THAT WILL CONTINUE TO PROVIDE MORE IMMEDIATE BENEFITS TO BOTH THE INDIVIDUAL TAXPAYER AND THE NATION AS WELL.

JUST AS IMPORTANT AS EXPLAINING THE BENEFITS OF SPACE, HOWEVER, IS GETTING ACROSS TO THE AMERICAN PEOPLE HOW LITTLE THESE PROGRAMS ACTUALLY COST.

THE SPACE PROGRAM HAS CONTRIBUTED DIRECTLY TO VIRTUALLY EVERY SEGMENT OF OUR NATIONAL STRUCTURE -- SCIENCE, COMMERCE, INDUSTRY, EDUCATION, AGRICULTURE, AVIATION, COMMUNICATIONS, MEDICINE, AND NATIONAL SECURITY. I AM HONESTLY UNABLE TO THINK OF ANY OTHER SINGLE PROGRAM THAT SO ACHIEVES OUR TOTAL SOCIETY FOR SUCH A RELATIVELY SMALL CAPITAL OUTLAY. BUT PARTLY BECAUSE THE APOLLO PROGRAM, IN PARTICULAR, IS IN SUCH CLEAR PUBLIC VIEW, MANY PERSONS HAVE GREATLY MISTAKEN IDEAS ABOUT THE AMOUNTS BEING SPENT FOR SPACE EXPLORATION. THERE IS A WIDE-SPREAD MYTH THAT IF WE STOPPED THE SPACE PROGRAM, THERE WOULD BE ENOUGH MONEY SAVED TO SOLVE OUR PROBLEMS OF HUNGER AND POVERTY AND URBAN BLIGHT.

PEOPLE SIMPLY DO NOT REALIZE, FOR EXAMPLE, THAT THIS NATION IS ALREADY SPENDING 42¢ OUT OF EVERY TAX DOLLAR FOR SOCIAL AND HUMAN RESOURCES PROGRAMS, AND ONLY 1.4¢ ON SPACE. IN FACT, WE GIVE AWAY ALMOST AS MUCH IN FOREIGN AID AS WE SPEND ON SPACE.

WE COULD CLOSE DOWN THE ENTIRE NASA COMPLEX, LET CAPE KENNEDY GO BACK TO PALM TREES AND SAND AND UNDERBRUSH, WIPE OUT THE EMPLOYMENT OF ALL AEROSPACE ENGINEERS AND SCIENTISTS, AND BY SO DOING SAVE A LITTLE MORE THAN \$3 BILLION A YEAR.

IF NASA'S 1.4¢ OF THE TAX DOLLAR WERE ADDED TO THE 42¢ ALLOCATED FOR SOCIAL PROGRAMS, DOES ANYONE BELIEVE THAT THIS FRACTIONAL ADDITION WOULD EVEN BEGIN TO COMPENSATE FOR THE PROBLEMS IT WOULD CREATE?

NOW, EQUATE THAT WITH THE EXPLORATION OF SPACE FOR THE BENEFIT OF ALL MANKIND. OR ASK IF 1.4¢ IS NOT A SMALL PRICE TO PAY FOR NATIONAL SECURITY AND PEACE OF MIND.

THE SOVIET UNION IS INCREASING -- NOT SLACKENING -- ITS EFFORTS IN SPACE EXPLORATION. IN THE PAST YEAR, THEY HAVE LAUNCHED FOUR SPACECRAFT FOR EVERY ONE OF OURS. IN SPITE OF THE UNFORTUNATE ACCIDENT THAT COST THE LIVES OF THE THREE SOYUZ-11 COSMONAUTS, THE RUSSIANS ARE CONTINUING THEIR INTENSIVE ORBITAL LABORATORY PROGRAM, OF WHICH SALYUT IS SIMPLY AN EXPERIMENTAL FORERUNNER.

AS YOU KNOW, THE UNFORTUNATE ACCIDENT OCCURRED IN A RETURNING SPACECRAFT. THE SALYUT LABORATORY ITSELF IS STILL ACTIVELY ORBITING AND HAS APPARENTLY BEEN HIGHLY SUCCESSFUL. MEANWHILE, AS YOU KNOW, IT WILL BE TWO YEARS BEFORE OUR EXPERIMENTAL COUNTERPART, SKYLAB, IS READY TO FLY.

DURING A PERIOD OF ABOUT FIVE YEARS WHILE WE ARE DEVELOPING OUR NEW SPACE SHUTTLE, WE CAN CONFIDENTLY EXPECT TO FALL BEHIND THE SOVIETS IN THE AREA OF MANNED EARTH-ORBITAL FLIGHT. BUT ONCE THE SHUTTLE IS READY TO FLY, WE WILL OVERTAKE THEM AGAIN IN ALMOST A SINGLE QUANTUM JUMP.

ONE LAST, CLOSELY RELATED -- AND VERY IMPORTANT -- POINT WE MIGHT MENTION IS IN REGARD TO PRESIDENT NIXON'S EXPRESSED GOAL OF ENCOURAGING GREATER INTERNATIONAL COOPERATION IN SPACE.

WE WANT COOPERATION WITH THE SOVIETS AS WELL AS WITH OTHER NATIONS THROUGHOUT THE WORLD. WE ARE READY TO DO OUR PART TO GET IT. BUT IF WE HAVE LEARNED THE LESSONS OF HISTORY, WE SHOULD KNOW THAT THE SOVIETS WILL NOT BE EAGER TO COOPERATE WITH A SECOND-RATE POWER, IN SPACE AS ON EARTH. AND THAT IS WHAT WE WILL BECOME IF WE DO NOT PROCEED WITH THE SPACE SHUTTLE IN THIS DECADE. WE CANNOT CREATE THE ENVIRONMENT NEEDED FOR SPACE COOPERATION, OR AN ERA OF ENDURING PEACE, BY HANDING OVER A MONOPOLY IN THE REALM OF ORBITAL FLIGHT TO THE SOVIET UNION OR ANYONE ELSE.

BUT THE SOVIET AND OTHER FOREIGN POWERS ARE PRAGMATIC. IF WE KEEP OUR MOMENTUM, I THINK WE CAN BE QUITE SURE OF THEIR COOPERATION. I AM ENTHUSIASTIC ABOUT THE PROGRESS WE HAVE MADE IN RECENT TALKS WITH THE SOVIETS ABOUT SOME OF THE FUTURE POSSIBILITIES IN THIS AREA. WORKING CLOSELY TOGETHER, BOTH COUNTRIES COULD DO MUCH MORE IN SPACE FOR THEMSELVES AND FOR MANKIND AT LESS COST. BEYOND THAT, SPACE COOPERATION COULD LEAD TO COOPERATION IN OTHER FIELDS AND GREATLY FACILITATE THE PRESIDENT'S EFFORTS TO ACHIEVE AN ERA OF LASTING PEACE FOR THE WORLD.

WE HAVE A PROGRAM THAT IS ABSOLUTELY VITAL TO THE FUTURE OF THIS NATION. WE HAVE A GREAT AND IMPORTANT MESSAGE TO GET ACROSS, AND IT IS ONE I INTEND TO FIGHT FOR. I AM COUNTING ON YOU TO JOIN ME.

WE CAN'T LET THE "OTHER FELLOW" DO IT -- AND WE CERTAINLY DON'T WANT TO LET THE SOVIETS TO DO IT FOR US. WHILE OUR SPACE EXPENDITURES HAVE BEEN GOING DOWN, THOSE OF THE SOVIET UNION HAVE BEEN GOING UP. IN TERMS OF PERCENTAGE OF GROSS NATIONAL PRODUCT, THEY ARE SPENDING AN ESTIMATED TWO PERCENT ON SPACE ACTIVITIES, WHEREAS WE ARE SPENDING LESS THAN HALF OF ONE PERCENT.

YOU HAVE MY PROMISE THAT I WILL SEEK EVERY OPPORTUNITY TO DELIVER THIS MESSAGE -- OUR MESSAGE -- THROUGHOUT THIS COUNTRY. AND, WE MUST SPEAK LOUDLY, CLEARLY AND DIRECTLY TO THE ONE GREAT COUNCIL OF THIS NATION ... THE AMERICAN PUBLIC.

THANK YOU.

SIGNIFICANT SPACE STATEMENTS

DR. FLETCHER CITES TECHNOLOGY AS CORNERSTONE OF U.S. MIGHT

Warns That Nation, at Some Time, May Be Forced to Outrace Another "Sputnik"

Dr. James C. Fletcher, NASA Administrator, gave a strong defense of the space program in a talk at the 14th Annual Aerospace Luncheon of the Los Angeles Area Chamber of Commerce in Los Angeles, Calif., Oct. 1. His remarks, slightly abridged, follow:

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"We hear a lot these days about what's wrong with America and about the need to reorder our priorities.

"Well, I'm here to tell you that there is something seriously wrong, that our priorities are out of whack when as a nation we pay people more not to work and more in farm subsidies than we do on space research, a program which impacts our national economy and vitally affects our national security.

"I say there is indeed something wrong with our sense of priorities when scientists have to defend with almost every breath the \$3.3 billion spent on space research in a nation that spends \$17 billion—five times as much—for tobacco products and cosmetics.

"I don't need to be told that our sense of priorities is dangerously lopsided when here in Los Angeles some of the most talented members of our technological team are driving taxis for a living while we are slipping behind Europe in aeronautical engineering and the Soviet Union is pulling ahead of us in many areas of space exploration.

"As a former university president, I am probably more aware than most people of the sentiments of the younger generation and the national pressures building for re-examining our priorities and for redressing injustices. As an individual, I agree with many of these objectives. Where I part company is on the way to best achieve these goals.

"As a scientist, I know that the answer to many of our social problems—worldwide as well as domestic—is to be found through technology. In a mature economic society such as ours, a strong technological base is a prerequisite for economic

progress, which in turn makes possible social progress.

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"A strong technology base is absolutely vital to the United States in terms of its contributions to international prestige, national security, and domestic peace of mind. I intend to speak up in the councils of government at every opportunity to press the case for technology. I intend to say my piece and say it loudly and clearly for all to hear, because I am convinced that further erosion of our technological leadership will start us on a downhill course from which it will be difficult to recover.

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Public Must Be Informed

"But we should not be too harsh with critics, for they do render an important service by reminding us repeatedly of the need to gain public understanding and support for the space program. For in our zeal to forge ahead in technical and scientific fields, it is possible to lose sight of the debt we owe to the great American public that so steadfastly sustained us during the early years.

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"The burden of explaining—and even convincing—the public of the necessity for continuing a well-balanced space program for the 1970s and beyond lies with those of us so directly involved. In this effort we should be comforted by the knowledge that, despite the dissenters of yesterday—and there have been many—the character and final judgment of Americans is clearly recorded in the progressive and pioneering history of this country.

"President Nixon, in his acknowledged personal commitment to advancing the exploration of space, has, I think, reflected the sentiments of the vast majority of the American public and their elected representatives.

"Before a joint session of the Congress on September 8, he again paid tribute to the key role of technology in the nation's past achievements. He also emphasized the role of technology in the future, as he spoke of the need for 'new programs to ensure that America's enormous wealth of scientific and technological talent is used to its fullest in the production for peace.'

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U.S. Led in Technology

"We painfully recall how America entered the Age of Space far behind the Soviet Union. It took a Sputnik to literally scare us into action. But America's competent industrial and technological institutions responded. Within a relatively short period of time we established decisive pre-eminence in space. America, in the eyes of the world, was the unchallenged leader in technology.

"But something has happened along the way. As some philosopher has said, 'The future isn't what it used to be.'

"The space program, with its broad engineering and scientific goals, is being seriously challenged not by the tired voices and redundant pens of a few critics . . . but by our own apparent inability to translate the broad diverse benefits of space into terms that are meaningful to the public at large. As scientists we recognize the contributions of advanced technology, but possibly because we are personally so deeply involved, we often find it difficult to understand why *everyone* doesn't see the value as clearly as we do. We need to bridge the information gap and explain to the largest possible audience why space is so vital to the future well-being of all mankind. To succeed, we need to redouble our efforts, starting now.

"Let us, then, find the forums to explain that the exploration and harnessing of space is not a Fourth of July firework display that can be set up, lighted for entertainment, and put away until the next year; it is a *national asset*, the engine that generates the technology needed to keep America competitive economically and secure militarily.

Lead in Technology Lost

"Over the years, we have seen Western Europe and Japan move with increasing assurance into fields of high technology where we were once acknowledged leaders.

"Americans invented the transistor, but we do not lead in solid-state electronics today.

"Americans invented the computer and advanced its capabilities—especially through the space program—by orders of magnitude. Today, the market for smaller computers (now in demand) is meeting ever-stronger competition from abroad.

"In areas such as textile manufacture, iron and

steel, shipbuilding and many others, the United States lags.

"The most ominous lag of all, however, is in the development of new technology for military and civil aviation. If we are losing our edge in that field, where we have held the leadership for so long, one thing is clear: We are not losing because the Europeans or the Soviets or anyone else have superior ability. Sad to say, it is not a matter of defeat—but of *default*.

May Be Forced to Regroup

"If this trend continues, I would predict with some certainty that someday, at some time, the United States will be forced—whether by peaceful, economic competition or by threat to our national security—to regroup our space industry team and outrace another 'Sputnik.' In the long run, this will be far more costly to the taxpayer than the price of a continuing well-balanced space program.

"The space program, as you are so well aware in Southern California, has begun losing its talented cadre of trained engineers, scientists, and administrators. How, then, can you play 'catch-up' football without a full team? I can tell you, *not very well*.

"We stand to be reminded occasionally that once England was the Queen of the Seas. When that power diminished, her great empire crumbled and she lost her prominent place in world affairs.

"The cornerstone of America's might is its technology. The implications are self-evident.

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Taxpayer Should Know

"But we must be prepared to justify the taxes Americans pay to support the space program. The taxpayer has the right to know—and we have an obligation to tell him—what kind of a return on investment he is getting for his money. Fortunately, we have a strong case. We have positive answers to questions like 'What do I get from space?' and 'What importance does space have in my future?'

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"Another question: How will the space program help the average citizen, now and in the years to come?

"We might start with some of the practical applications of near-Earth orbital spacecraft.

"Take communications satellites. The average citizen probably sees transoceanic color television programs almost every day. Of course, this also has its drawbacks—bad news has always traveled fast, but now it is instantaneous.

"My point is this. We need to remind people that these new communication miracles come straight from space research, courtesy of NASA.

"We need to tell them also about the communications miracles they do not see—about commercial and business communications that are faster and cheaper by far than even a few years ago. And about how, less than two years from now, NASA satellite technology, through the medium of educational TV, will help educate previously illiterate natives of India in the smallest back-country settlements. Our experimental ATS-F satellite will beam educational TV directly to low-cost receivers in 5,000 villages. And that's just the beginning. We can't even begin to estimate the future potential and value of this project alone.

"Make sure the benefits are made clear—for this is an enormously effective way of attacking worldwide problems involving ignorance, hunger, and disease.

Earth Resources Program

"In an even more direct way, NASA's Earth Resources Technology Satellite program will attack problems of malnutrition and hunger.

"Again the story should be familiar to you. You must be prepared to share your knowledge of satellites that can identify crops, detect insect infestations and blight, monitor soil conditions, and thus enable farmers to raise bigger and better crops. You probably already know that NASA is monitoring on a daily basis the spread of corn blight (in this country, a disease that, if left unchecked, would destroy a major portion of the most producing capability of our nation).

"Tell of how satellites will be able to take readings on ocean temperatures and currents, monitor areas where fish are abundantly located, making available one of the most nutritional and least expensive sources of high-grade protein to feed the world's hungry and under-nourished.

"Of, if the subject of pollution and world ecology arises, be sure to mention the possibility of a global environmental monitoring system which watches over all portions of the thin veneer on our planet's surface which supports life—the biosphere. Satellites, together with associated ground

monitoring equipment for calibration, can detect major polluters and how they impact on their neighbors and on others thousands of miles away. They can also detect minute changes in global environment—changes in the ozone layer. The CO₂ content and oxygen content of the atmosphere—tiny incidents which are capable of producing major changes in world ecology. Signals which warn not only of hemisphere contamination, but world-wide weather changes, even the possibility of a return of another ice age. The monitoring system also has the potential of detecting not only illegal polluters but illegal crops—marijuana, poppies, etc.—as well, with a system that transcends national boundaries.

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Aids All of Society

"The space program has contributed directly to virtually every segment of our national structure—science, commerce, industry, education, agriculture, aviation, communications, medicine, and national security. I am honestly unable to think of any other single program that so benefits our total society for such a relatively small capital outlay. But partly because the Apollo program, in particular, is in such clear public view, many persons have greatly mistaken ideas about the amounts being spent for space exploration. There is a widespread myth that, if we stopped the space program, there would be enough money saved to solve our problems of hunger and poverty and urban blight.

"People simply do not realize, for example, that this nation is already spending 42¢ out of every tax dollar for social and human resources programs, and only 1.4¢ on space. In fact, we give away almost as much in foreign aid as we spend on space.

"We could close down the entire NASA complex, let Cape Kennedy go back to palm trees and sand and underbrush, wipe out the employment of all aerospace engineers and scientists, and by so doing save a little more than \$3 billion a year.

"If NASA's 1.4¢ of the tax dollar were added to the 42¢ allocated for social programs, does anyone believe that this fractional addition would even begin to compensate for the problems it would create?

"Now, equate that with the exploration of space for the benefit of all mankind. Or ask if 1.4¢ is not a small price to pay for national security and peace of mind.

Soviets Increase Efforts

"The Soviet Union is increasing—not slackening—its efforts in space exploration. In the past year, they have launched four spacecraft for every one of ours. In spite of the unfortunate accident that cost the lives of the three Soyuz-11 cosmonauts, the Russians are continuing their intensive orbital laboratory program, of which Salyut is simply an experimental forerunner.

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"One last, closely related—and very important—point we might mention is in regard to President Nixon's expressed goal of encouraging greater international cooperation in space.

"We want cooperation with the Soviets as well as with other nations throughout the world. We are ready to do our part to get it. But if we have learned the lessons of history, we should know that the Soviets will not be eager to cooperate with a second-rate power, in space as on Earth. And that is what we will become if we do not proceed with the Space Shuttle in this decade. We cannot create the environment needed for space cooperation, or an era of enduring peace, by handing over a monopoly in the realm of orbital flight to the Soviet Union or anyone else.

Enthusiastic About Progress

"But the Soviet and other foreign powers are pragmatic. If we keep our momentum, I think we can be quite sure of their cooperation. I am enthusiastic about the progress we have made in recent talks with the Soviets about some of the future possibilities in this area. Working closely together, both countries could do much more in space for themselves and for mankind at less cost. Beyond that, space cooperation could lead to cooperation in other fields and greatly facilitate the President's efforts to achieve an era of lasting peace for the world.

"We have a program that is absolutely vital to the future of this nation. We have a great and important message to get across, and it is one I intend to fight for. I am counting on you to join me.

"We can't let the 'other fellow' do it—and we certainly don't want to let the Soviets do it for us. While our space expenditures have been going down, those of the Soviet Union have been going up. In terms of percentage of gross national product, they are spending an estimated two percent on space activities, whereas we are spending less than half of one percent.

"You have my promise that I will seek every opportunity to deliver this message—our message—throughout this country. And, we must speak loudly, clearly and directly to the one great council of this nation . . . the American public."

NEW OPPORTUNITIES FORESEEN FOR USE OF SPACE IN 1970s

Von Braun Tells European Businessmen First Goal Will Be to Improve Conditions on Earth

Speaking before a group of European businessmen at a "Report on America" dinner sponsored in Washington on Oct. 7 by Time, Inc., Dr. Wernher von Braun, Deputy Associate Administrator of NASA, reviewed the space agency's program for the current decade and said every nation should make deliberate effort to grasp the significance of man's movement into space. His remarks follow in part:

"The first decade of the United States' space activities was climaxed by the first landing of men on the Moon. A great deal of knowledge and experience was gained during this initial period that can be placed in three categories.

"We have learned of the limitless stores of scientific knowledge to be obtained in space.

"We have learned that space vehicles can be designed and operated to provide useful, even vital, services to mankind.

"We have learned that man can fly in space, perform useful work, and explore another world a quarter of a million miles from Earth, and return safely.

"It is difficult, if not impossible, to choose any one of these as the most important to man. They are all important. From time to time our activities in space may focus on one or more, according to national requirements and policy, and technological feasibility.

"But man's movement into space, both with automated, unmanned spacecraft and manned vehicles, is the single most significant fact. Every nation, as every individual, ought to make deliberate effort to grasp its significance, for it is now an integral part of our lives, however remote it may seem personally at this time.

Another Door Opened

"Man has *left* Earth. There is as great an awesome potential in that simple statement as there is in the fact, man *appeared* on Earth. Human destiny now has another door opened to it that previously was firmly locked.